

SAMSUNG

ELECTRONICS SAMSUNG TELECOMMUNICATIONS AMERICA, INC.
1130 E. Arapaho Rd
Richardson, TX 75081 U S A.
TEL 972-761-7000 FAX 972-761-7001

May 24, 1999

Express Mail Receipt No. EE518532989US

Commissioner of Patents
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Box Patent Application
Washington, D.C. 20231

Re: U.S. Patent Application for "WIRELESS NETWORK SYSTEM
SELECTION MECHANISM WITHIN A MOBILE STATION"
Our File: STA.WTL.001

Dear Sir:

Enclosed Please find the following documents for filing:

- 1) Express Mail Certificate of Mailing;
- 2) Patent Application (37 pages);
- 3) Drawings (5 sheets);
- 4) Declaration and Power of Attorney;
- 5) Assignment and Recordation Form Cover Sheet;
- 6) a check in the sum of \$800.00 for the application filing fee and
Assignment recordal fee;
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| BASIC FEE | | | \$760.00 | \$760.00 |
| TOTAL CLAIMS | 20-20 | 0 | \$18.00 | \$0.00 |
| INDEPENDENT CLAIMS | 3-3 | 0 | \$78.00 | \$0.00 |
| MULTIPLE DEPENDENT CLAIM PRESENTED | 0 | | \$260.00 | \$0.00 |
| SUBTOTAL | | | | \$760.00 |
| ASSIGNMENT RECORDAL | 1 | | \$40.00 | \$40.00 |
| TOTAL | | | | \$800.00 |

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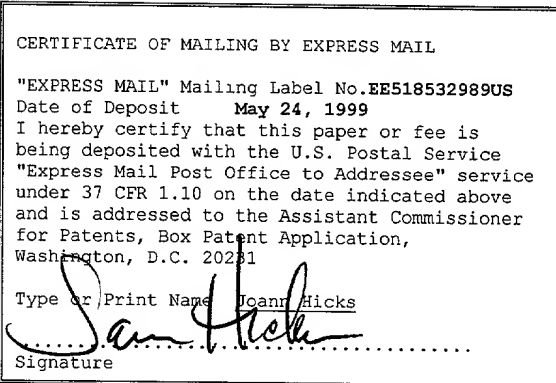
Very truly yours,



John C. Han
Registration No. 41,403

JCH/jh
Enclosures

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**Wireless Network System Selection Mechanism Within A
Mobile Station**

BACKGROUND OF THE INVENTION

Technical Field of the Invention

The present invention relates generally to wireless communications systems, and more specifically, to mobile stations having multi-mode capabilities.

Description of Related Art

With the advent of wireless telecommunications systems, a number of different protocols, procedures and systems have been developed to effectuate radio communications within wireless telecommunications networks. Wireless telecommunications systems, such as Advanced Mobile Phone System (AMPS), Time Division Multiple Access (TDMA), and Code Division Multiple Access (CDMA) systems are all examples of various wireless telecommunications standards and protocols. Within a given telecommunications system, such as CDMA, there may also exist a number of different protocols, frequencies, and parameters. Examples of such frequencies may include 800 MHz and 1900 MHz. Further examples of such protocols may include Personal Communications System (PCS) and Global System for Mobile (GSM).

Given the great number of wireless telecommunications service providers and respective service areas associated thereto, more and more geographic areas are being covered by multiple system providers. Each system within a

particular geographic service area then provides an overlapping coverage with other system providers and competes for its own customers and service revenue. As an illustration, an AMPS service provider as well as a CDMA service provider may concurrently provide overlapping service coverage over a particular geographic area and compete for service revenue therein. Mobile subscribers, as a result, benefit from such multiple overlapping coverage by being able to choose from a number of different providers, service quality, and service plans.

With the development of telecommunications technology, mobile stations have also been improved wherein a single mobile station is capable of interfacing to and communicating over a number of different network systems using different protocols. For example, a mobile station capable of selectively communicating over two different telecommunications protocols is known as a "dual-mode" terminal. A dual-mode mobile station, for example, enables a mobile subscriber to communicate over a preferred or home service provider's communication system

until the mobile station travels or roams outside of the
respective coverage area. In response to a determination
that the preferred communication system is no longer
available, the dual mode mobile station then utilizes the
5 available secondary or alternative telecommunications
system with different protocol. By selectively switching
over to the secondary telecommunications system, the dual
mode mobile station is able to continuously provide radio
communications service without interruption to its
10 associated user.

A multi-mode mobile station typically provides such
capability by maintaining a preferred provider or system
list. When a mobile station is first turned on or
initialized, the mobile station attempts to access the
15 system identified as the most preferred system. As
described, this identification may be made by referencing
a system preference list maintained within the multi-mode
mobile station. In response to a determination that the
most preferred system is not available, the mobile station
20 then attempts to access the next system identified by the

system preference list. The mobile station repeats the above access processes until an acceptable system is allocated or the systems associated with the priority list are exhausted. A similar re-selection may occur when a
5 mobile station already registered with a first telecommunications system travels into an area covered primarily by a second telecommunications system. As a result, in response to a determination that the current signal quality associated with the first
10 telecommunications system is falling below the acceptable threshold level, the mobile station then attempts to access the second telecommunications system.

Conventionally, a multi-mode mobile station monitors a particular message transmitted over a forward-link
15 channel associated with the preferred service provider to determine its access status. As long as the mobile station is able to periodically receive that particular message within a predefined time period, the mobile station maintains its access to that particular service
20 provider. As an illustration, within a CDMA system, the

mobile station maintains its access to the preferred CDMA system as long as the mobile station receives a page channel (PCH) message every 3 seconds as required by T30m of Interim Standard '95 (IS-95). However, maintaining
5 access to a particular service provider solely based on the number of particular forward link messages received within a given time period is inefficient and undesirable. There may be instances where even though the requisite PCH messages are periodically received from a CDMA service
10 provider, the "health" of the overall system is not acceptable. Accordingly, the health of the system may not be properly determined by merely considering the number of messages received within a given time period. Consequently, only a few valid PCH messages would need to
15 be received for a mobile station to continuously use the preferred system while another system (such as another CDMA or AMPS) is available and might be capable of providing better or more reliable telecommunications service. Maintaining access to such less desirable system
20 while another more reliable system is available to service

the mobile station causes undesirable and inefficient results. For example, such poor system condition increases the probability of failure for both mobile originated and terminated calls. It further causes poor handoffs to other systems.

Accordingly, there is a need for a mechanism to enable a multi-mode mobile station to more effectively select an optimal network system.

SUMMARY OF THE INVENTION

The present invention discloses a method and apparatus for selectively accessing a desirable mobile service system by a multi-mode mobile station. A multi-mode mobile station prioritizes the compatible mobile service systems therein. When initialized, the mobile station accesses the most preferred mobile service system available thereto within a particular service area. Thereinafter, in response to a determination that the quality of forward channel messages received from the selected mobile service system is below the indicated

threshold value, the multi-mode mobile station attempts to access the next preferred mobile service system.

5 The multi-mode mobile station first attempts to determine the access status of the selected mobile service system by determine whether a requisite number of forward channel messages is received and properly demodulated. In response to a determination that the mobile station failed to receive the requisite number of control channel messages, the multi-mode mobile station selects the next available service system in a conventional manner. 10 However, even if the requisite number of control channel messages are properly received, the mobile station then determines the "health" of the received messages by evaluating the error rate associated with the received messages. 15

Accordingly, although the mobile station is capable of maintaining its access to the most preferred service system, the multi-mode mobile station voluntarily selects another compatible mobile service system in order to 20 acquire an alternative system that might be able to

provide better or more reliable radio service.

In one aspect, the present invention includes a method and apparatus for enabling a multi-mode mobile station to efficiently select and access a radio service system within a multiple system coverage area.

In another aspect, the present invention includes a method and apparatus for determining the access status of a particular mobile system by evaluating the number of control channel messages as well as the quality of those received messages.

In yet another aspect, the present invention includes a method and apparatus for selecting a mobile service system based on the quality of the forward channel messages received by a multi-mode mobile station.

In yet another aspect, the present invention discloses a method and apparatus for determining the quality of the received forward paging channel messages by calculating the Frame Error Rate (FER) associated therewith.

In still another aspect, the present invention

provides a method and apparatus for selectively communicating over a first radio system and a second radio system by evaluating the error rates associated with forward channel messages transmitted by said radio systems.

BRIEF DESCRIPTION OF THE DRAWINGS

A more complete understanding of the method and apparatus of the present invention may be had by reference to the following detailed description when taken in conjunction with the accompanying drawings wherein:

FIGURE 1 is a diagram illustrating the different states performed by a multi-mode mobile station to select a particular mobile service system for communication;

FIGURE 2 is a flow diagram illustrating the steps performed by a multi-mode mobile station to access and maintain a particular mobile service system;

FIGURE 3 is a diagram illustrating the gray zone within a multi-coverage telecommunications service area;

FIGURE 4 is a flow diagram illustrating the steps

performed by a multi-mode mobile station to select an alternative service system in accordance with the teachings of the present invention; and

FIGURE 5 is a block diagram of a multi-mode mobile station in accordance with the teachings of the present invention.

DETAILED DESCRIPTION OF THE DRAWINGS

FIGURE 1 is a diagram illustrating the different states performed by a multi-mode mobile station to select a particular mobile service system for communication. Whenever a multi-mode mobile station enters power up state 100 by turning on the mobile station for the first time or being invoked out of the inactive mode, the mobile station attempts to initiate all relevant variables and parameters by entering initialization state 110. During the initialization state 110, the multi-mode mobile station determines which particular service system to use. As an illustration, the mobile station may select from Code Division Multiple Access (CDMA) System, Time Division

Multiple Access (TDMA) System, Advanced Mobile Phone System (AMPS), Personal Communications System (PCS) and Cellular, etc. Even within the same CDMA systems, the mobile station may choose between System A and System B.

5 Typically, a multi-mode mobile station includes a priority list prioritizing the compatible mobile service systems therein. As an illustration, within a dual-mode mobile station, the CDMA system is pre-selected or programmed as the preferred service system and the AMPS
10 system is designated as the less preferred or alternative service system. During the initialization state, the multi-mode mobile station then attempts to access the most preferred service system indicated by this priority list. Only when the most preferred service system is not
15 available within the current service area, does the mobile station then attempt to access the next service system indicated on the priority list.

Once a particular system is selected, the mobile station tunes to the selected system. If the selected
20 system is analog, for example, the mobile station begins

its analog operations. In case the selected system is CDMA, the mobile stations begins its CDMA operations. Such operations include acquiring a pilot channel associated with the selected CDMA system. Once a pilot
5 channel is acquired for the CDMA system, the mobile station then synchronizes itself with the providing CDMA system by tuning to an appropriate sync channel. A base station providing radio coverage over the appropriate geographic area transmits sync channel messages over a
10 sync channel and contains requisite information such as system time, pilot PN offset, long code state, etc. Utilizing these parameters to synchronize with the serving CMDA system, the multi-mode mobile station then moves to idle state 120.

15 By entering the idle state 120, the multi-mode mobile station actively monitors the messages communicated over the paging channel. Such messages include both broadcast messages as well as messages directly to a specific mobile station. Accordingly, the paging channel enables the
20 serving base station to communicate with the multi-mode

mobile station when the mobile station is not on a traffic channel. The page channel also enables the mobile station to obtain system information from the serving base station. The system information, for example, contains
5 both network wide and base station specific parameters which are needed by the multi-mode mobile station to send messages to the serving base station. The paging channel is also utilized by the mobile station to originate an outgoing call or to receive an incoming call request.

10 Whenever the multi-mode mobile station wishes to request a mobile service, the mobile station enters the access state 130. During this state, the mobile station communicates with the serving base station via communicating over an access channel. As an illustration,
15 the multi-mode mobile station may send an originating message over an access channel to request an outgoing call connection. Similarly, whenever an incoming call connection is directed to a particular mobile station, the serving base station first sends a page message over a
20 page channel to locate the destination mobile station.

The mobile station, in response to the paged message, then responds over an access channel.

The multi-mode mobile station also periodically registers with the serving base station to update its geographic location. Such a registration message is sent over an access channel as well. Once a particular service has been negotiated over an access channel, such as an incoming call or outgoing call connection, the mobile station then enters the traffic channel state 140 to communicate data/information. The multi-mode mobile station may also perform a soft or hard handoff to a different coverage area or request additional services therefrom.

Accordingly, the multi-mode mobile station attempts to access the most preferred and available mobile service system predefined therein and monitors the appropriate control channel until a particular service is requested or initiated. The multi-mode mobile station further stays with that particular mobile service system until the selected service system is no longer capable of providing

mobile service thereto. When the signal quality transmitted by the selected mobile service system becomes no longer acceptable or available, the multi-mode mobile station then attempts to access an alternative mobile service system to continuously provide mobile service to an associated end user.

FIGURE 2 is a flow diagram illustrating the steps performed by a multi-mode mobile station to access and maintain a particular mobile service system in a conventional manner. As fully described above, the multi-mode mobile station first enters the initialization state when powered up or re-initialized 100. Utilizing a priority list or other determination methods, the mobile station then selects a particular mobile service system to access at step 200. The multi-mode mobile station attempts to determine whether the selected mobile service system is available within the current geographic area by searching for a pilot channel associated with the selected mobile service system at step 210. In response to a determination that the requisite pilot signal is detected

and recognized, the multi-mode mobile station then attempts to synchronize with the selected system (e.g., CDMA system) by acquiring the requisite sync channel at step 220. Utilizing the system parameters and timing information received over the sync channel, the mobile station then synchronizes with the selected system and acquire the proper offset at step 230. The multi-mode mobile station is now in idle state and capable of initiating mobile service with the serving base station at step 240. Thereafter, the multi-mode mobile station monitors the page channel at step 250 to determine whether the selected mobile service system is capable of continuously providing the requisite mobile service. As an illustration, after properly synchronizing with a particular mobile system service, the mobile station may travel and roam out of the current coverage area. As another illustration, the mobile station may travel into a geographic area still covered by the selected mobile service system, but terrestrial conditions associated with the newly entered area prevents the mobile station from

properly communicating with the serving base station. Accordingly, in order to ensure that the mobile station is capable of communicating with the selected mobile service system, the mobile station constantly monitors the page channel on the forward link to determine whether a requisite number of page messages are received within a given time period. As an example, in accordance with the Interim Standard 95 (IS-95), the mobile station remains within a selected CDMA system and assumes the paging channel is acceptable if the arrival rate of valid page messages is sufficient to avoid expiration of IS-95 timer T30m. Accordingly, as long as the minimum number of page channel messages are received and demodulated by the multi-mode mobile station, the mobile station assumes that the quality of the radio service is acceptable and stays with the selected service system. As a result, using existing methods, only a few valid PCH messages would need to be received for the multi-mode mobile station to continue using CDMA instead of an alternative analog system (or another CDMA system). This is inefficient and

undesirable if the alternative system is available to provide better or more liable service. Such a mechanism for remaining with the existing poor service system until complete loss of paging channel as defined by the T30m standard generates high probability of failure for both mobile originated and terminated calls as well as poor handoff to an alternative system due to incorrect system targeting.

FIGURE 3 is a diagram illustrating a "gray zone" within a multi-coverage telecommunications service area. Due to a large number of mobile telecommunications service providers and systems in developed countries, such as the United States, a particular geographic area is typically covered by two or more service providers and associated service systems. As illustrated in Fig. 3, a particular service area 300 is being covered by two different service system providers. CDMA and AMPS base stations are co-located at a first geographical location 310 as illustrated. Assuming that the CDMA system is preferred over the AMPS system, a first coverage area extending out

to the ninety percent (90%) of the CDMA cell edge
represents the desired CDMA coverage area. As shown in
Fig. 3, this optimum CDMA coverage area is represented by
Area A 320. On the other hand, the full CDMA coverage
5 area as determined by the loss of pilot, paging, and synch
channels are represented by Area B 330 as further
illustrated in Fig. 3. As a result, although the
requisite pilot, paging, and synch signals may be received
and demodulated within Area B 330, the CDMA system would
10 provide the desired radio service only within Area A 320.
Accordingly, the remaining area depicted as Area C 340 is
then sometimes identified as a "Gray Zone." A dual-mode
mobile station located within the Gray Zone would
therefore show service indication although E_c/I_o is poor
15 and the requisite paging channel is lost periodically but
never for more than three (3) seconds as required by the
IS-95 T30m timer. The dual-mode mobile station is thereby
located at the relevant CDMA cell edge and at an outer
limit of forward and/or reverse link budget of the serving
20 CDMA system. As described above in Fig. 2, a mobile

station located within a Gray Zone tends to experience higher probability of failure for both mobile originated and terminated calls. The dual-mode mobile station also tends to perform poor or incorrect handoff to an
5 alternative system, such as AMPS, due to incorrect system targeting.

In accordance with the teachings of the present invention, a dual-mode mobile station 345 located within a Gray Zone (Area C 340) as illustrated in Fig. 3 is then
10 selectively instructed to access an alternative system that is overlaid on the current service area and capable of offering a substantially better grade of mobile service. As shown in Fig. 3, a second AMPS base station 360 located within the CDMA Gray Zone 340 and a third AMPS
15 base station 350 located neighboring thereto are able to provide better radio service to the multi-mode mobile station 345. Instead of remaining on the existing poor CDMA system until the monitoring paging channel is completely lost and then being forced to select an
20 alternative service system, such as AMPS, a multi-mode

mobile station attempts to access an alternative system in response to a determination that the current preferred system is no longer able to provide an optimum radio signal quality. Such a determination is made even though
5 the requisite number of forward link messages, such as paging channel messages, are received and adequately demodulated by the mobile station within a given time period.

FIGURE 4 is a flow diagram illustrating the steps performed by a multi-mode mobile station to select an
10 alternative service system in accordance with the teachings of the present invention. As fully described in Fig. 2, a multi-mode mobile station selects the most preferred service system available in an associated service area, synchronizes with appropriate parameters,
15 and enters the idle state at 400. Thereafter, the multi-mode mobile station monitors the page channel to periodically receives a requisite page channel message at 410. The multi-mode mobile station then determines
20 whether a page channel message has been received within a

required time period at 420. As an illustration, within a CDMA system, a mobile station has to receive and be able to adequately demodulate a PCH message every 3 seconds in accordance with the IS-95 timer T30m. In response to a
5 determination that a proper PCH message has not been received within the determined time period (no decision link 430), the mobile station is then no longer in service with the preferred mobile service system and attempts to access an alternative service system at 490 in a
10 conventional manner. This is a situation wherein the mobile station is completely out of the serving CDMA system's coverage area and is no longer able to detect or demodulate the forward channel messages transmitted by the serving CDMA base station.

15 On the other hand, in response to a determination that the mobile station is still receiving and capable of adequately demodulating a PCH message as required by the appropriate standard (yes decision link 440), in accordance with the teachings of the present invention,
20 instead of assuming that the "health" of the paging

channel is good and acceptable, the mobile station then evaluates the error rates associated with the PCH message received therein at 450. As an example, the dual-mode mobile station attempts to evaluate the actual "health" of the page channel by measuring frame erasure rates (FER) associated with the received PCH messages. The FER for the paging channel is defined as the number of invalid paging channel messages (messages with bad Cyclic Redundancy Check - CRC) divided by the total number of paging channel messages the mobile station attempted to receive within a given time period. The relevant measurement period can be a sliding window. The measured FER is then compared against a predetermined threshold value at 460. If the measured FER within a given time window is less than the specified threshold value (No decision link 470), a determination has been made that the health of the system is still acceptable and the mobile station returns to step 410 to repeat the above described process. On the other hand, in response to a determination that the evaluated FER value is greater than

the specified threshold value (Yes decision link 480), the mobile station then determines that the health of the system is no longer acceptable. In accordance with the teachings of the present invention, although the requisite number of PCH messages have been received, the mobile station then voluntarily attempts to select and access an alternative system at step 490. As described above, the mobile station, for example, references its internal service priority list and attempts to access an alternative service system specified therein. The alternatively accessed service system may be of higher or lower priority than the previous service system referenced by the service priority list.

Alternatively, the mobile station may also determine the health of the received PCH messages by correlating the PCH FER to the measured E_c/I_o of the pilot channels associated thereto. E_c/I_o is a ratio in (dB) between the pilot energy accumulated over one PN chip period (E_c) to the total power spectral density (I_o) in the received bandwidth. Accordingly, the E_c/I_o could be used directly

as an indicator of "health."

The threshold value for determining the health of the page channels may also be dynamically defined. As an illustration, the threshold value may be dynamically assigned based on the history of FER versus access failure rates (origination or termination) on the paging channel. A mobile user or mobile manufacturer may also define an acceptable threshold value therein.

Upon successfully accessing an alternative service system, the mobile station then enters the idle state 495 and starts the monitoring process as fully described above to again determine whether the selected service system is capable of continuously providing acceptable radio service.

FIGURE 5 is a block diagram of a multi-mode mobile station in accordance with the teachings of the present invention. A mobile station 345, in accordance with the teachings of the present invention, includes a radio-frequency (RF) module 500 for receiving radio signals transmitted by a serving service system. The received

signal signals are then demodulated by a demodulation subsystem 510. A processor subsystem 520 associated within the mobile station then includes a counter 540 for determining the FER value associated with the received PCH
5 messages within a given time window as fully described above in Fig. 4. The calculated FER value is then compared against a threshold value stored within a threshold value register 550 by a comparator 560. In response to a determination that the calculated FER value
10 is greater than the specific threshold value, the call processor 530 is invoked to initiate the process for accessing an alternative service system as fully described above.

Although preferred embodiments of the method and
15 apparatus of the present invention have been illustrated in the accompanying Drawings and described in the foregoing Detailed Description, it will be understood that the invention is not limited to the embodiments disclosed, but is capable of numerous rearrangements, modifications,
20 and substitutions without departing from the spirit of the

invention as set forth and defined by the following
claims.

63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

WHAT IS CLAIMED IS:

1 1. A method within a multi-mode mobile station for
2 communicating over a particular radio system wherein said
3 multi-mode mobile station is capable of selectively
4 communicating over a first radio system and a second radio
5 system and wherein said first radio system is preferred
6 over said second radio system, said method comprising the
7 steps of:

8 determining whether said preferred first radio system
9 is available to provide mobile service;

10 accessing said preferred first radio system;

11 receiving a plurality of messages over a control
12 channel associated with said preferred first radio system;

13 determining the error rate associated with said
14 plurality of messages;

15 comparing said determined error rate with a
16 predetermined threshold value; and

17 if said determined error rate exceeds said
18 predetermined threshold value, then

19 accessing said less preferred second radio system.

1 2. The method of claim 1 wherein said step of
2 determining whether said preferred first radio system is
3 available further comprises the step of determining
4 whether an acceptable number of said messages are received
5 within a predetermined time period.

1 3. The method of claim 1 wherein said step of
2 determining whether said preferred first radio system is
3 available further comprises the step of determining
4 whether a pilot signal from said preferred first radio
5 system is detectable.

1 4. The method of claim 1 wherein said messages are page
2 channel (PCH) messages.

1 5. The method of claim 1 wherein said step of
2 determining said error rate comprises the step of
3 determining a Frame Error Rate (FER) associated with said
4 plurality of messages.

1 6. The method of claim 5 wherein said step of
2 determining said FER is performed while said multi-mode
3 mobile station is in Idle state.

1 7. The method of claim 5 wherein said step of accessing
2 said less preferred second radio system is performed after
3 said determined FER exceeds said predetermined threshold
4 value over a plurality of consecutive time periods.

1 8. A method of selecting a radio system within a multi-
2 mode mobile station wherein said multi-mode mobile station
3 is capable of selectively communicating over a first radio
4 system and a second radio system, said method comprising
5 the steps of:

6 accessing said first radio system by said multi-mode
7 mobile station;

8 periodically receiving a message signal over a
9 forward channel associated with said first radio system;

10 determining the number of message signals received
11 within a first predetermined time period;

12 determining the error rate associated with said
13 message signals received within a second predetermined
14 time period; and

15 accessing said second radio system in response to a
16 determination that the number of message signals received
17 within said first predetermined time period meets a first
18 threshold value, but that said error rate associated with
19 said message signals exceeds a second threshold value.

1 9. The method of claim 8 wherein said step of receiving
2 said message signal comprises the step of receiving a page
3 message over a page channel (PCH).

1 10. The method of claim 8 wherein said step of
2 determining said error rate comprises the step of
3 determining a Frame Error Rate (FER) associated with said
4 received message signals.

1 11. The method of claim 8 wherein said first radio system
2 is preferred over said second radio system within said
3 multi-mode mobile station.

1 12. The method of claim 11 wherein said first system
2 comprises a Code Division Multiple Access (CDMA) system.

1 13. The method of claim 11 wherein said second system
2 comprises a Advanced Mobile Phone System (AMPS).

1 14. The method of claim 8 wherein said step of
2 determining said FER is performed while said multi-mode
3 mobile station is in Idle state.

1 15. The method of claim 8 wherein said step of accessing
2 said second radio system is performed after said
3 determined FER exceeds said predetermined threshold value
4 over a plurality of time periods.

1 16. The method of claim 8 wherein said second threshold
2 value is determined by calculating a signal-to-noise ratio
3 (E_c/I_o) associated with a pilot channel.

17. A multi-mode mobile station for selectively communicating over a first radio system and a second radio system wherein said first radio system is preferred over said second radio system, comprising:

means for determining whether said first radio system is available to provide service;

means for accessing said first radio system;

means for receiving messages over a forward channel associated with said first radio system;

means for determining an error rate associated with said received messages;

means for comparing said determined error rate against a particular threshold value; and

means for accessing said second radio system in response to a determination that said determined error rate exceeds said particular threshold value.

1 18. The multi-mode mobile station of claim 17 wherein
2 said messages received over said forward channel comprise
3 page messages over a page channel (PCH).

1 19. The multi-mode mobile station of claim 17 wherein
2 said means for determining said error rate associated with
3 said received messages comprises means for determining a
4 Frame Error Rate (FER) associated with said messages.

1 20. The multi-mode mobile station of claim 17 wherein
2 said threshold value is determined by calculating a
3 signal-to-noise ratio (E_c/I_o) associated with a pilot
4 channel.

1 **ABSTRACT OF THE DISCLOSURE**

2 A multi-mode mobile station independently determines
3 the radio signal quality of a serving mobile system by
4 evaluating the error rate associated with the received
5 forward-link-channel messages. In response to a
6 determination that the calculated error rate is greater
7 than an acceptable threshold level, the mobile station
8 then attempts to access an alternative service system
9 capable of providing better and more reliable
10 telecommunications service.

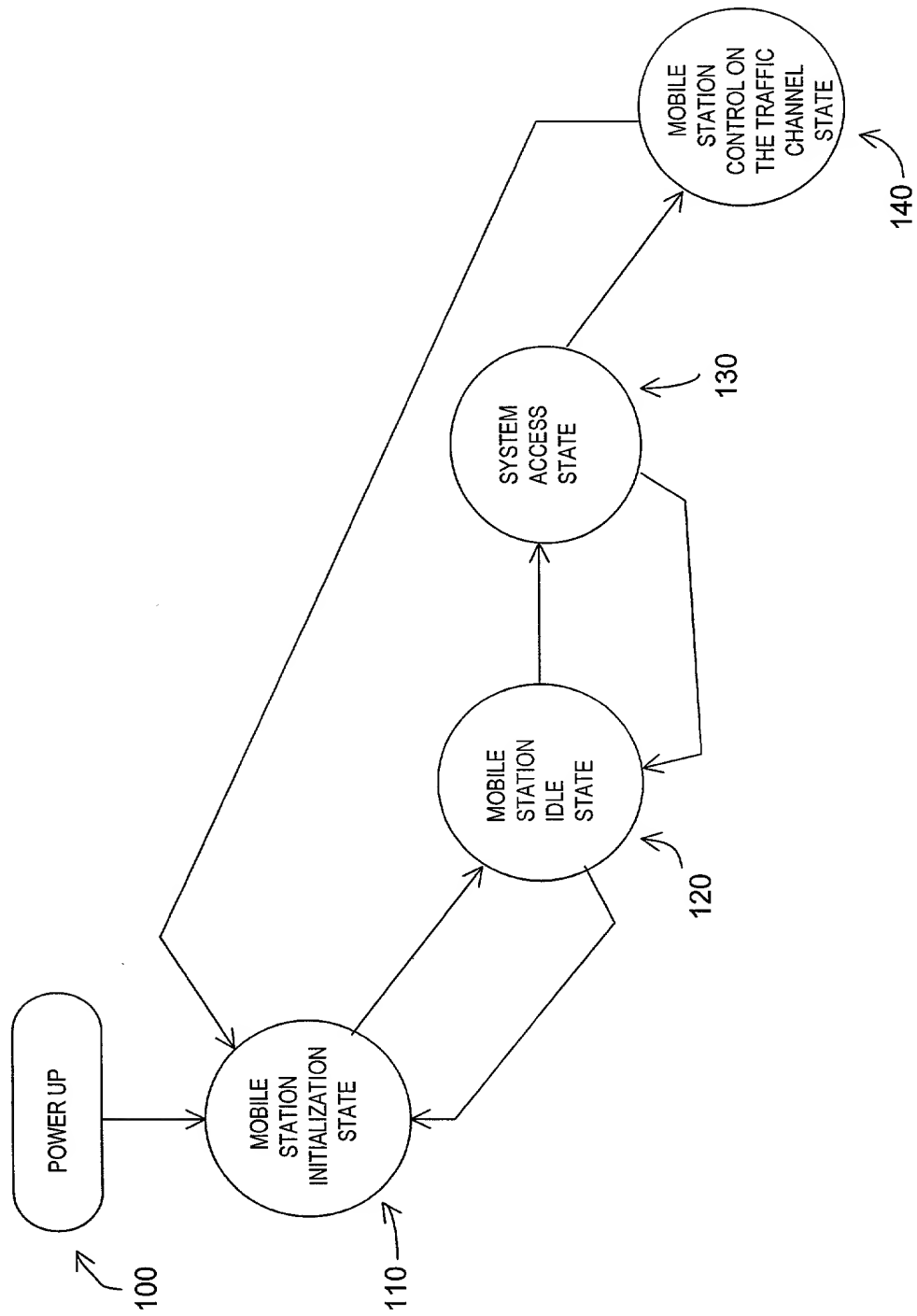


FIG 1 (PRIOR ART)

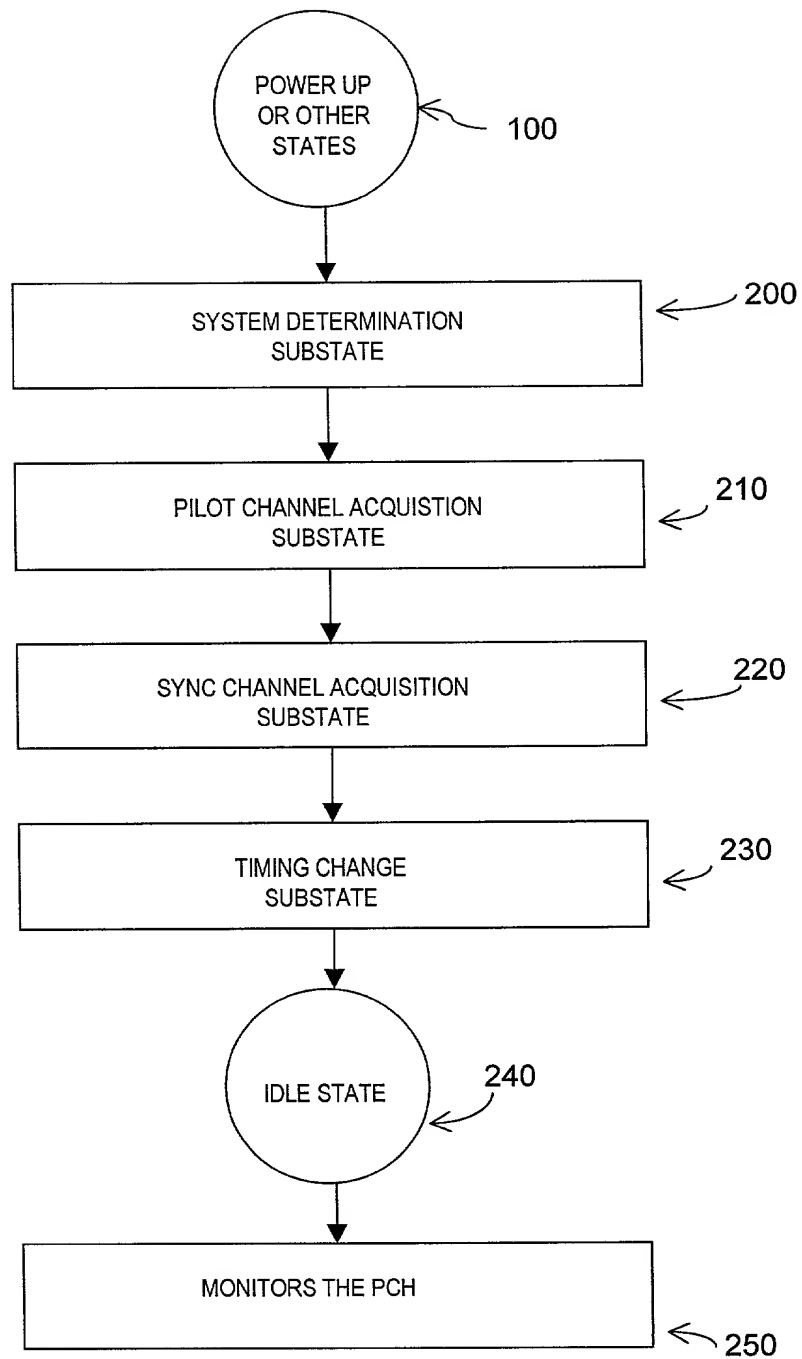


FIG 2 (PRIOR ART)

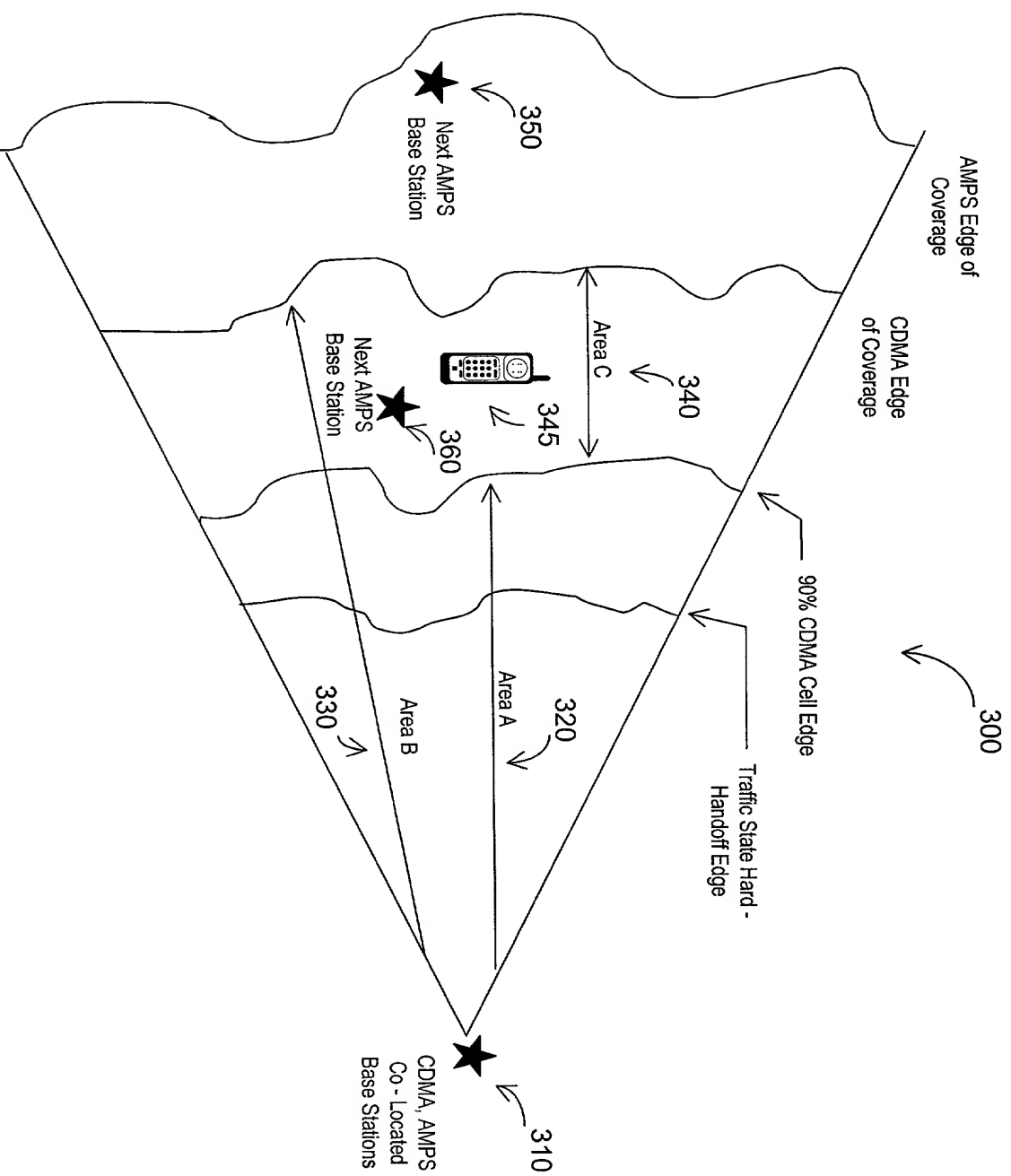


FIG 3

FIG 4

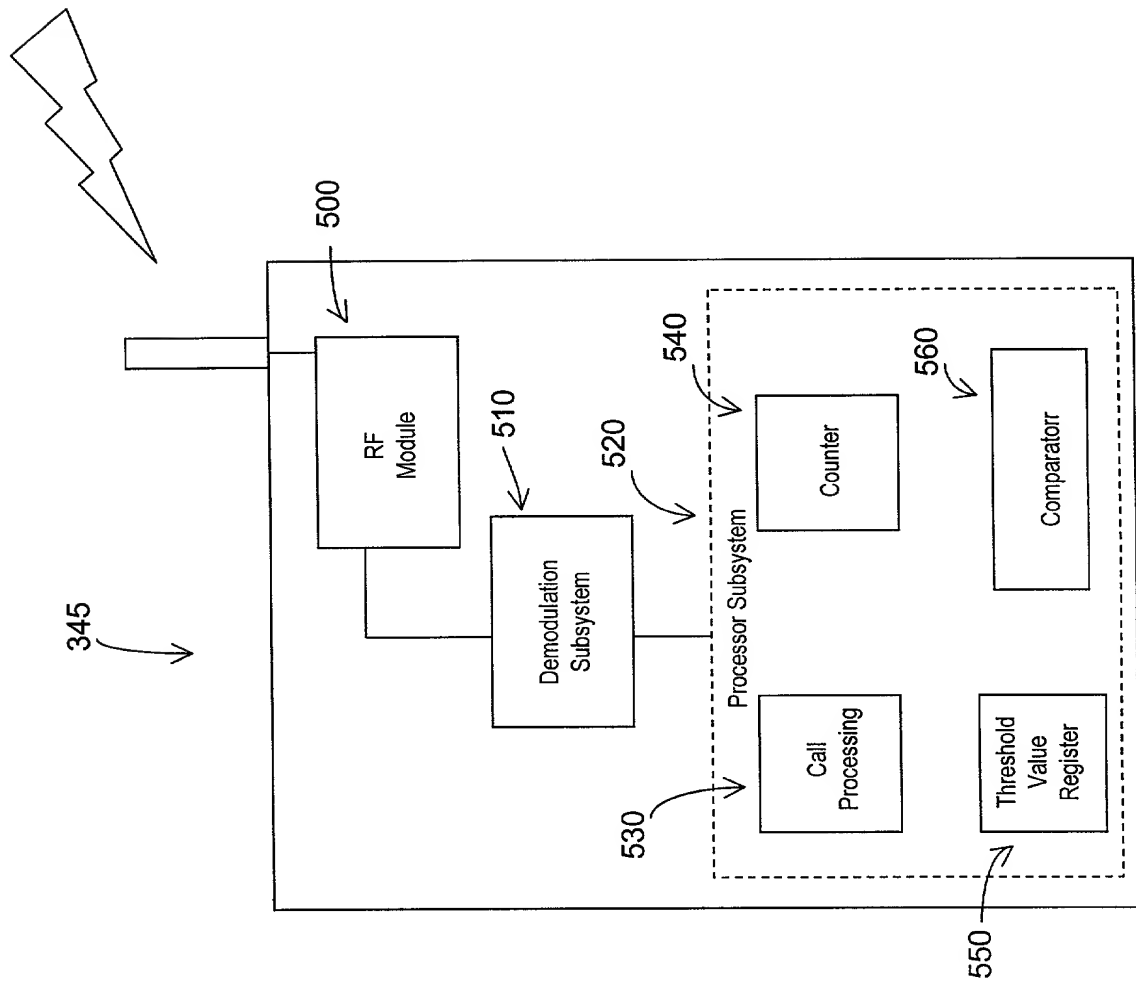


FIG 5

DECLARATION AND POWER OF ATTORNEY

As the below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor of the subject matter which is claimed and for which a patent is sought on the invention, design or discovery entitled:

WIRELESS NETWORK SYSTEM SELECTION MECHANISM WITHIN A MOBILE
STATION

the specification of which is attached hereto.

I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above;

I acknowledge the duty to disclose to the Office all information known to me to be material to the patentability of this application as defined by Title 37, code of Federal Regulations, § 1.56.

I hereby claim no foreign priority benefits under 35 U.S.C. § 119 of any foreign application(s) for patent or inventor's certificate on which priority is claimed.

I hereby claim no benefit under 35 U.S.C. § 120 of any United States application(s) for patent. I acknowledge the duty to disclose to the Office all information known to me to be material to patentability as defined in § 1.56 which became available between the filing date of any prior application(s) and the national or PCT international filing date of this application.

I hereby appoint:

John C. Han, Registration No. 41,403

of SAMSUNG TELECOMMUNICATIONS AMERICA, INC.,

William a. Munck, Registration No. 39,308

John T. Mockler, Registration No. 39,775

of the firm of Novakov & Davis P.C., and

Steven R. Greenfield, Registration No. 38,166

of the firm of Jenkins & Gilchrist, P.C. my attorneys with full power of substitution and revocation to prosecute this application and to transact all business in the United States Patent and Trademark Office connected therewith, and to file and prosecute any international patent applications filed thereon before any international authorities under the Patent Cooperation Treaty.

Send correspondence to: John C. Han, Esq.
Samsung Telecommunications America, Inc.
1130 E. Arapaho Road
Richardson, Texas 75081

Direct telephone calls to: John C. Han, Esq.
(972) 761-7607

Atty. Docket No.: STA.WTL.001

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information an belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under § 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Full name of inventor: Bryan Jeffery Moles

Inventor's signature: Bryan Jeffery Moles

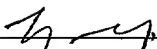
Date: 5-14-99

Residence (City, County, State): Dallas, Collin County, Texas

Citizenship: U.S.A.

Post Office Address: 7421 Frankford Rd.
Dallas, Texas 75252

Full name of inventor: Nim Keung Leung

Inventor's signature: 

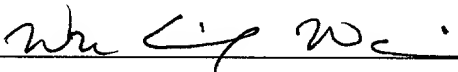
Date: 5-14-1999

Residence (City, County, State): Plano, Collin County, Texas

Citizenship: Hong Kong

Post Office Address: 2917 Woods Drive
Plano, Texas 75025

Full name of inventor: Sing-Wai Wu

Inventor's signature: 

Date: 5/14/1999

Residence (City, County, State): Frisco, Collin County, Texas

Citizenship: Hong Kong

Post Office Address: 9710 Prestmont Place
Frisco, Texas 75035